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OCTOBER QUARTERLY MEETING

OF THE

Massachusetts Association of Boards of Health.

The quarterly meeting of the Massachusetts Association of Boards of Health was held in Brookline on Thursday, October 30, upon invitation of the local Board of Health. Assembling at the Town Hall, Washington Street, at 10.30 A.M., members were greeted by Brookline officials, and under their guidance visited the board of health laboratory and the new contagious hospital. This hospital has two one-story pavilions, separated by an administration building, one of the pavilions being for the treatment of scarlet fever and the other for the treatment of diphtheria. At 1 P.M. the members reached the Public Baths, where they were given an exhibition of swimming, and where dinner was served and the business meeting held.

Dr. H. P. Walcott, President, presided at the business meeting. He opened it by saying,—

Gentlemen, I have the pleasure of presenting to you the chairman of the Board of Health of Brookline.

SPEECH OF WELCOME BY JAMES M. CODMAN, JR., ESQ.

Mr. President and Gentlemen,— It is a great pleasure to welcome to Brookline so many guests, so many public officers, and especially so

many medical men. Our Brookline Board of Health is not a board of medical men. There is not and has not for many years been a physician in our number; but we rely, of course, very much upon the advice of professional medical men. We like to keep in touch with the medical profession and to know what the doctors are thinking about and talking about, and we enjoy having you here and listening to you. Now quite a varied programme still awaits you, and it would not be appropriate for me to detain you from it any longer. [Applause.]

The records of the July meeting were read and approved.

The following ladies and gentlemen were nominated by the Executive Committee for membership in the Association: —

W. W. McKibben, M.D., of Worcester.
Humphrey C. Moynihan, of Southbridge.
Willard E. Ward, of Brookline.
Mrs. Ellen H. Richards, Massachusetts Institute of Technology, Boston.
May S. Holmes, M.D., Superintendent and Resident Physician of the Isolation Hospital, Worcester.
Agnes C. Vietor, M.D., New England Hospital for Women and Children Boston.

The President.— I hope the Association notice the fact that the Executive Committee present to you the names of three ladies for membership in this body, and they probably also notice the fact that that list is headed with the name of a lady who has given years of most enthusiastic and most intelligent service to the cause of public health. It is a most auspicious name to begin the new membership of the Association with.

The ladies and gentlemen named were elected to membership.

Dr. Durgin.— I want to give notice that at the next meeting of the Association there will be a request for a vote to increase the annual dues from $1.50 to $2.00. This becomes necessary in order to give moderate aid in the publishing of the *Journal*.

The President.— Dr. Durgin's motion, under your by-laws, is referred for action to the next meeting of the Association.

The first business for the afternoon is the conclusion of the dis-

cussion on the report of the Committee on Diphtheria Bacilli in Well Persons. The Association will be very glad indeed to hear from Mr. Aldrich, the superintendent of schools of Brookline, on that subject.

SANITATION IN THE SCHOOLS.

MR. ALDRICH.— *Mr. Chairman and Gentlemen,*— It is in response to Dr. Chase's invitation that I venture to take a moment of your time. Otherwise, I should feel that I was not justified in intruding. Dr. Chase has been good enough to print for use in the schools in Brookline the special report prepared by the committee of which Dr. Chapin was chairman. It relates to the general matter of inducing habits of cleanliness among school children. Our local Board of Health has prepared a placard of *that* size, and one has been posted in each school-room, near the teacher's desk; and then a copy of a leaflet has been put into the hands of every teacher, with the request at the end that "all teachers carefully read and preserve the above report, and carry out as far as possible its excellent suggestions." I presume I am right in thinking that Brookline is the first place to avail itself of the report of your Special Committee, and to make an active effort through the agency of the schools to put in operation its teachings.

If I am justified in saying one other word, I should like to take this occasion to acknowledge the great indebtedness of the whole school department of Brookline, first and foremost the children, then the teachers and the school officials, to our local Board of Health. It would take many words fairly to express the many good offices that they have done for us. Perhaps nobody better than a working superintendent of schools realizes how great the task is before us. The traditions of one sort and another are so strongly intrenched that nothing short of heroic warfare serves to overcome them. Within two years I had occasion to discuss with the city government in Springfield — a typical, wide-awake, progressive New England city — the placing of some baths in a school building. There never had been baths in a school building in that city, and with many of the city fathers that seemed to be a sufficient reason why there never

should be any. It was only when I was able to call to their attention sundry young children who told me that their clothing had been sewn on for the winter and they could not be expected to take a bath [laughter],— which is the literal truth, gentlemen,— only when I was able to adduce such a circumstance, that I was able really to convert that city government to the necessity of having school baths incorporated in the building. I think it is a distinct step in the development of that city to have secured that one move in the matter of baths.

As further evidence of the great work to be done, I want to call to your attention the benighted policy which we have pursued in the general care of our sanitaries, our out-buildings. I believe I was nearly or quite the first working school man to see that all retiring-rooms, toilet-rooms, in connection with school buildings were provided with toilet paper; in a word, to make certain that children at school were provided with the same conveniences — necessities is the word, I think, rather — that they would find in a well-regulated home. As some of us look back to our own boyhood, and recall a kind of a shanty that stood out in the rear of the building, to which we used to resort at all stages of the weather and temperature, and then ask ourselves what we were expected to do when we were there, we must be impressed with the idea, I think, that we have been curiously oblivious of the demands of children. I don't know how we can expect to have decency and cleanliness and all the desirable qualities manifested on the part of children unless we make it possib' for them.

'urthermore, one who is actively interested in schools gets some curious light on some phases of child life. In the school we don't often come face to face with the genuine child. We have there a sort of an artificial product, made up with more or less conscious purpose on the part of the pupil to conform to the wishes and expectations of older people. I found on the seashore this summer a very interesting bit of testimony that had been kicking around for a year, written by a little girl eight years old. On one side of the sheet, under the date of July 21,— this was a year ago,— she had indicated her pleasures: on the other side of the sheet she had indicated her troubles. There was the testimony of a genuine child. I will not

weary you with reading the entire list, but there is one that is significant; and I perhaps will read one or two others, because they are a little funny and will do for after dinner. This little miss, in enumerating her pleasures, had said, "Had chicken and mash potato at dinner." But the one thing among her pleasures which I think we are justified in noticing in this connection is this. Next to the last in the list comes this statement: "Didn't have my bath to-day." In the mind of an eight-year-old that was a distinct pleasure. Bathing is a cultivated taste; and I am inclined to think that there is no more important office for school men, and members of boards of health as well, than to induce in people a genuine love for cold water. I am inclined to think that, take the American people by and large, we could get on with less arithmetic, for instance, while we need more cold water and more music. When it comes to the little girl's troubles, there are also some things which are amusing. If there were time, I should be glad to read them. To show you the honest and ingenuous and transparent quality of the utterance, perhaps I may take the last two among her troubles: "Aunt Edith is as doleful as two rats"; and then, finally, "Wish my arms would get fat." There is a genuine child, expressing herself in all honesty, not at all expressing views which will be acceptable to some older person.

Renewing, then, the statement that no week goes by when we are not indebted to the good offices of the Board of Health, and especially to their very efficient agent, Dr. Chase, I will not trespass further on your attention.

THE PRESIDENT.— Have the members of the committee present anything which they wish to say further upon this matter? Has Dr. Chapin or Dr. Hill anything to say?

The next business, then, is the paper upon the sanitary inspection of tenements, by Dr. Chapin, of Providence, R.I.

SANITARY INSPECTION.

BY DR. CHARLES V. CHAPIN, OF PROVIDENCE, R.I.

Mr. Chairman and Gentlemen,— Owing to a slight error, the title of what I have to say was noted in the programme as "The Sanitary Inspection of Tenements," whereas it is simply "Sanitary Inspection." I know very little about the tenement-house problem as it is understood in the great cities; and what few ideas I do have on that subject differ quite a little from those I have on the subject of general routine sanitary inspection.

I presume you are all familiar with Professor Sedgwick's most excellent treatise on the Principles of Sanitary Science,— if not, you ought to be,— and will accept his definition of hygiene as "the whole science and art of the conservation and promotion of health." Sanitary science, he says, "is that body of hygienic knowledge which, having been sufficiently and critically examined, has been found, so far as tested, to be invariably true."

Sanitary art is the method and process by which these principles are applied.

According to these definitions, sanitary inspection can only find justification, as a prominent phase of public health work, by clearly and in a marked degree preventing disease. Sanitary inspection, and subsequent executive action based upon it, interfere decidedly with the liberty of the individual. Sanitary inspection, and the abatement of nuisances which it is intended to accomplish, form a large part of the work of health officers. A sharp distinction must be drawn between sanitary and medical inspection: the former deals with nuisances, the later with infectious diseases; and there is very little connection between the two. As a rule, as much, if not more, time, money, and inspectors are devoted to sanitary than to medical inspection. In the mind of the public the chief function of the board of health is to abate nuisances. As a general thing, only one class of nuisances are considered by the health officer, those caused by the decay of organic matter. The board of health was originally authorized to deal with this kind of nuisance, because it was believed to be a fertile cause of sickness. When the filth theory of disease originated, I do not know; but in 1797 it was

potent enough to influence the General Court of Massachusetts to enact that the board of health shall "remove all filth of any kind whatever . . . whenever such filth shall, in their judgment, endanger the lives or health of the inhabitants." This act was a consequence of the typhus fever outbreaks of the time, and reflected the views of many as to the filth origin of that disease. In the revision of 1836 the law took its present form, which requires that the "board or the health officer shall order the owner or occupant, at his own expense, to remove any nuisance, source of filth, or cause of sickness." It has been copied by over a dozen other States, and is the model of most American nuisance legislation. The war against filth was not, however, waged very vigorously, except perhaps during epidemics, until the middle of the nineteenth century. The vogue of the filth theory was due largely to the labors of Edwin Chadwick, an English attorney, who, drawing the most unwarranted conclusions from observed facts, vehemently urged that the infectious diseases were due to decay, and that by municipal cleanliness they could be stamped out and the general health of the people vastly improved After 1850 these views rapidly gained adherents in this country, and for forty years the word of the sanitary inspector was supreme in affairs of public health.

But all that has been changed. The filth theory of disease is dead. The parasitic nature of infection has been established, not by rash generalizations, but by laborious scientific work. The parasites of the infectious diseases, with rare exceptions, do not grow outside of the body; on the contrary, they tend to quickly perish. These diseases do not originate in filth, though a few of them are transmitted by certain kinds of filth. Typhoid fever and cholera are spread in fecal matter; dysentery may be; and it is possible also that some other enteric infections may be transmitted in this way, but, practically, no other disease which we are here likely to meet. By preventing fecal matter from one person from reaching the alimentary canal of another we can prevent typhoid fever and perhaps some of the other intestinal infections. To do this, public water supplies must be made pure and sewers must be constructed; but these are the duties of the department of works, not of the department of health. Milk and perhaps other foods must be protected from infection with danger-

ous filth, and the local board should do all it can in this line. The local board can and should enforce sewer connections, abolish privy vaults, and close dangerous wells. This is properly the work of the sanitary inspector, and is of real value in preventing disease. Most of his work, however, has to do with nuisances which have little relation to health.

If we look over the list of nuisances reported by the sanitary inspector of the average New England city, it will be seen that the most of them have little or nothing to do with the causation of disease. Most of the plumbing defects are trivial and harmless. The removal of dead cats, of ash heaps, of cellar rubbish, is not calculated to have much effect on the public health. Hen-houses, dog-kennels, and stables are usually a nuisance; but have they ever been shown to cause sickness? The same may be said of offensive trades. These and many more like them are nuisances; and our modern municipal civilization, and our sense of common decency, and fairness to our neighbors, require their abatement. But why not let the police attend to it, instead of the board of health? In glancing at the common forms of nuisance that are taken cognizance of by the sanitary inspector, it will be admitted, I think, that none except a few have any but the most indirect and occasional influence upon health. There are doubtless many other matters which are much more intimately connected with the public health, but which receive no attention from health officers.

If public health work were to-day to be organized for the first time, without prejudices, and by scientific men, sanitary inspection as now understood would receive scant attention. Its importance to-day is the legacy of unscientific theory. The abatement of nuisances in most cases accomplishes little for the promotion of public health and takes much time and money; and it is, moreover, a positive hindrance to sanitary progress. There is no question that the filth theory is still held in the highest respect by the public and a large portion of the medical profession, and by many health officers. The lately arrived immigrant complains at the health office that her "cesspool is running all over the yard, and she is afraid of cholera," the staid citizen wants the old pan closet removed from his hired house lest his children catch diphtheria, and even the well-educated

physician wishes the health officer to test the plumbing in his patient's house to see through what pin-hole the typhoid germs escaped. The daily papers and the medical journals tell us how modern sanitation — by which is meant municipal and domiciliary cleanliness — has reduced the death-rate and stamped out disease. Except to some extent in the fecal-borne diseases, municipal cleanliness has had little effect on the death-rate. We can never teach people the right way to avoid disease as long as they hold such erroneous views as to its origin. When the health officer devotes so much time to seeking out and abating nuisances, he is doing much to further the acceptance of most erroneous notions.

I am perfectly willing to admit that sanitary inspection has accomplished much in improving the homes of the poor and protecting them against the exactions of unjust landlords. It is a civilizing, and probably in a general way a wholesome thing to improve the dwellings of the poor and their surroundings. As you are perhaps aware, I am a firm believer in the importance and value of personal cleanliness as a means of preventing the transmission of the communicable diseases. It is personal rather than municipal cleanliness that health officers must teach. The latter may be left to other reformers. It is doubtless true that municipal clealiness may do much to teach and encourage personal cleanliness; but it is very doubtful if the regulation of many of the petty details which constitutes the bulk of the routine work of the sanitary inspector really accomplishes much in this direction.

Then, again, I firmly believe it is the business of the State to protect the individual against all sorts of nuisances. But most nuisances do not affect health except in a very indirect way, and there are many reasons why protection from nuisances should be afforded by the police department rather than by the health department. No medical knowledge is needed to abate nuisances. Nevertheless, law and custom have thrown this work on the board of health.

There will doubtless be very little dissent from my conclusions thus far that sanitary inspection and the abatement of nuisances are comparatively unimportant factors in the preservation of the public health, that they occupy a greatly undue portion of the time, money, and thought of sanitary officers, and that this undue promi-

nence operates most disastrously in keeping alive erroneous views as to the causation of disease; but, granted these premises, there may be great difference of opinion as to what should be done. My notions at present are somewhat as follows: —

First. We should lose no opportunity to teach the truth. When a person complains to us of a nuisance, although we may try to abate it, we must, if it is one which does not affect health, explain that fact, and state that it is abated simply on the ground that it is a nuisance. We must, morning, noon and night, teach that it is infected persons, not decaying matter, that cause the infectious diseases, and that immunity is to be sought not by municipal, but by personal cleanliness. Perhaps a carefully prepared circular on dirt and disease, for use as occasion demands, would not be amiss.

Second. It is worth considering whether it would not, on the whole, be better if the control of nuisances were vested in the police department. The department of health would then be relieved of much useless annoyance, and the public would be less likely to attribute so great sanitary importance to this work. The health department might then have more time and money to devote to its own proper work, such as the isolation of infectious diseases at home or in the hospital, disinfecting, quarantine, the inspection of schools, control of the milk supply, instruction of the public, and, what is most important, the scientific investigation of the all too numerous unsolved problems connected with these subjects.

Third. Don't look for trouble. As long as existing laws are on the statute books, it is necessary to carefully consider all complaints, and secure, if possible, the abatement of all real nuisances. It is perhaps necessary that the poorest class of dwellings — the slums, so called — should receive systematic inspection. Humanity and the public welfare require it, and at present none but the board of health will do it; but to make regular house-to-house inspections, seeking out and noting down a host of minor defects in plumbing or general cleanliness, is only placing ourselves in the false position of attempting to promote health by discredited means. The sanitary inspection of the house in cases of communicable disease should usually be avoided.

Fourth. We can oppose putting new nuisance work on the health

department. Smoke inspection and gas-pipe inspection are good things, but keep them out of the health department. It is very unfortunate, in my opinion, that the inspection of plumbing should so often be in the department of health. I opposed this in Providence, and there the inspector is an independent officer. Plumbing inspection ought to be merely a feature of building inspection. It is unfortunate that sanitary officials are the ones ostensibly responsible for the unnecessary requirements which are so often found in plumbing codes. The health department also should be relieved of all scavenging work.

In fine, while we should be vigilant to abolish such real dangers to health as the privy vault, the polluted well, or the anopheles-infected pool, we should interfere with nuisances not affecting health as little as the law and public sentiment will permit; and we should strive ever to educate the public to a proper understanding of the quite limited relationship of filth to disease. Nor should we deem it a discredit to depart somewhat from the teachings of early sanitarians and to modify their theories. Those soldiers present a far better defence who depend upon the accuracy of modern arms than those who cling to the scattering fire of the blunderbuss of our forefathers.

THE PRESIDENT.— Discussion of this paper will be opened by Professor Sedgwick.

PROF. SEDGWICK.— *Mr. President and Gentlemen,*— Dr. Chapin did me the honor to let me read over carefully his paper before he read it here to-day, and I want to say that I consider it epoch-making. It seems to me that health officers, and especially sanitary inspectors, have too often been in that attitude which is very well described as "barking up the wrong tree." Nothing is more annoying to an epidemiologist, nothing is more astonishing, I may say, than to see the misdirected efforts of members of boards of health. Only this very morning I visited a house in which ten cases of typhoid fever have appeared; and, asking if the board of health had been there, I was told that they had, and that they had first examined the plumbing and, secondly, taken a sample of the milk. I venture to say that

the examination of the plumbing was of absolutely no consequence whatever, practically, in hunting down the cause of that trouble, and, secondly, that the examination of the milk, inasmuch as it was two or three weeks after the disease had been taken by the victims, was also of no consequence whatever. I did not learn, though they may have done so, that the board had gone any further. And it is not this board alone that is given to work of that kind. Wherever I have seen the sanitary inspection of boards of health, I have been impressed with the large proportion of it devoted to barking up the wrong tree.

When I found that my friend Dr. Chapin, for whose opinion I always have the highest respect, himself a leading health officer of New England, a man conversant with all these problems, had written this paper, I felt that a better day was dawning. Here is a man who, from his experience, boldly comes forward, and says that a large proportion of the so-called sanitary work of boards of health is not in any strict and right use of the sense sanitary or medical work, and that it does not to any great extent contribute to the betterment of the public health, at least directly. Of course, a great deal of the work boards of health must always do will be of the very indirect kind, and no one appreciates that or values it more highly than I. It is only that the things that are the easiest to do are so apt to get done in a routine fashion, and the more difficult things are so apt to get neglected in a routine fashion, that makes it necessary for Dr. Chapin to bring this matter strongly and sharply before this Association. Take, for instance, some of the things that he has mentioned. Plumbing inspection,— that is a time-worn practice. When cases of disease are reported, go and look at the plumbing. Well, it does not do any harm to look at the plumbing; and I think we may say it does not do any good. It is well, of course it is essential, to have good plumbing; but the cases in which the disease reported had anything to do with the defects in the plumbing are very few and very far between. It has always seemed to me that boards of health might do a great many better things than that, and work which plumbers could not do and which ordinary inspectors could not do; but I have always been very modest about remarking on this subject, because I thought that I might not know the practical

difficulties of the work of a board of health. When, however, Dr. Chapin, with his large experience, comes forward and makes these statements, I give a hearty second to his idea. It seems to me that he has hit the nail very squarely upon the head.

I was hoping that something would be said on the sanitary inspection of tenements, and I daresay it will by others. I have seen a good deal of tenement-house work first and last, and it is pretty discouraging business. It seems to me that we have got to begin there a campaign of education. I am very glad that Mr. Aldrich is or was here, because I think that we have got here to co-operate with the teachers and the school authorities. I have maintained for a good while that it would not be at all a bad thing in a good many school-houses,— I have said this in the city of Boston, where the school-houses need attention more than they do in Brookline,— it would not be a bad thing at all, at least in many of the schools in that city, to spend the first half-hour in the morning in cleaning up the school-room,— in actually setting the children to work, I mean, in cleaning the desks, picking up pieces of paper, and seeing that the windows were clean. Why, there are many school buildings in Boston where the windows are washed only annually, or semi-annually, perhaps, and where dirt is all over the window. We have had meetings, school meetings, to deal with school hygiene, in rooms in which the windows evidently had not been washed for months. I know that it is an expensive thing to wash windows; but why not have the children spend a few minutes every day in cleaning up the school-room? That would be a practical lesson in sanitation which they could take back to the tenement houses, and which they would perhaps be inclined to put in force.

This thing has got to begin down at the ground. It is not enough to go and inspect tenements, and point out defects in space, and all that, although those are things that need doing. You have got somehow to make the people themselves desire cleanliness, and that is uphill work. But that it is uphill work is no reason why we should not begin on it somewhere; for we shall never get anywhere till we do. We never shall get tenements kept in anything like decent repair until the protoplasm or habits of the tenants have been made over somewhat.

A friend of mind, a bright young fellow, happened to own some tenements in New York City, down near the Mulberry Bend; and somebody got after him, and told him that he ought to put in modern tenements. He did so, fitted them all finely, had good plumbing put in, open plumbing even. When everything was ready, he said to the tenants in the neighborhood: "Now come in and live decently. Be 'white' people." They came in; and the first night they were there they sawed off all the lead pipe they could find anywhere, and sold it for old junk. Water ran all over the place, and his efforts went for nothing. What was the trouble? The trouble was not in him: the trouble was in the tenants. It was in their protoplasm and in their habits and in their education, which led them to be contented with dirt and filth.

I do believe that a board of health can do a great deal in tenement-house inspection. I think, to begin with, they must know what there is in their town. I think each half wants to know how the other half lives. I think there should be records kept of the houses, and of the sizes of the rooms and the chances for ventilation or non-ventilation; and any family that is particularly filthy, and likely to be a centre of small-pox or scarlet fever or diphtheria, or anything else, should have its place marked on a map. It should all be charted out and studied as an engineer would study an engineering problem. We want, in fact, to introduce a good deal of engineering into this subject. Those things noted should be kept as matters of record and matters of fact. There should be periodic inspections, but all such will go for nothing unless sooner or later we teach the people to desire cleanliness. That, as I have already said, is slow, uphill work; but it has got to be done, and I don't know where it can be done unless it is done in the public schools. And I don't know any subject to which the public schools might better address themselves than to the teaching of simple cleanliness and the love of cleanliness in children, because out of that might come eventually something better. If we don't get that, it is very certain that in tenement houses in the lower quarters of our cities and towns dirt will continue to reign; and disease, which always follows in the train of dirt, will continue to prevail.

It seems to me that in this line, and in those other admirable lines

that Dr. Chapin has mentioned, there is work in abundance — interesting, fresh, valuable, modern work — for boards of health. They should resist, it seems to me, the putting upon them of everything that nobody else will take. Because they have great powers, there is danger that they may be shorn of those powers some day, unless they limit themselves to their own business. The public will stand anything from boards of health in the direction of the restraint of disease; but it may some day become a question whether they will stand all sorts of regulations regarding plumbing and regarding gas inspection and smoke inspection, and so on. At any rate, why prejudice the normal and fine work of boards of health — medical, scientific, and truly sanitary work — by emphasis and great expenditures upon things which, after all, are secondary rather than primary? At the same time, I think it ought to be understood that anything that contributes to general cleanliness is to be desired and forwarded by boards of health. It is on this ground, of course, that nuisances have been given them to look after. But there is danger of exaggerating these easier things and of neglecting the more difficult, the more scientific, and more modern aspects of the work to which boards, in my judgment, should nowadays address themselves.

THE PRESIDENT.— I will interrupt the usual list of speakers but for a moment by asking Dr. Durgin to give us some additional information, which I think he has in his possession, with regard to this collection of typhoid fever cases that Professor Sedgwick has spoken of. Dr. Durgin.

DR. DURGIN.— Gentlemen, I don't know what board of health is alluded to; but I want to say that I know of one board of health which does not look for typhoid fever in the plumbing and does not take specimens of milk in which to find the typhoid fever. I do know of a lot of cases of typhoid fever which were reported to the board of health about noon to-day. There is a department connected with this board of health which, under statute law, examines for the solids of milk; but it has nothing to do with typhoid fever. Instead of coming here this afternoon, medical officers have gone out to investigate these cases. There are, I

should say, more cases than Professor Sedgwick has named. Within a few minutes before I left to come here I learned that there were about fifteen cases in all, most of which had occurred among medical students and those who took their meals at a certain restaurant at the South End. Suspicion rests upon the celery and the milk, and those two suspected articles are being traced this afternoon. I shall be happy to report progress later on, but I don't want this board of health I have in mind to be looked upon this afternoon as barking up the wrong tree unless it is true.

Mr. Coffey.— Mr. President, I must confess that, as a layman, I approach this subject to-day with the utmost diffidence, considering the fact that the reader of the paper is a man of acknowledged position in the sanitary world and one whose opinions are entitled to a great deal of consideration; but, when Dr. Chapin very courteously a few days ago sent me a copy of his paper, I was rather amazed — and I thought to myself that I had heard before that this was the age of inconoclasm — that a good many of our cherished beliefs were being smashed, and I thought that this was another in the same line. I could not help agreeing, of course, with a great deal of what he said; but it struck me that he was going too far in the deductions he drew from the facts, recited.

All health officers who have had very much experience are aware that we know the germs which cause several of the infectious diseases; but do we know all the conditions concerning them? Take the question of diphtheria, for instance. That is caused by the Klebs Loeffler bacillus; but yet we know, from the experience of every man connected with medical work or with health work, that there is a disease which is called pseudo-diphtheria, which closely resembles it,— resembles it so closely, indeed, that the best physicians are misled, and cannot pronounce authoritatively upon the case without a bacteriological examination. This disease, which resembles diphtheria so closely as to deceive the best practitioners, is caused by other germs. It only differs from diphtheria in the profound toxæmia which follows the true diphtheria; and yet I am told by the bacteriologists that under other conditions these germs give rise to other diseases. The point that I want to make is that, while we

know that diphtheria *per se* is caused by the Klebs Loeffler bacillus, we don't know in that disease or in any other infectious disease all the causes that go to make up the conditions that make the introduction and the growth of the bacteria in the human subject possible.

I have always believed, and I still continue to believe, that pure air is a necessity for good health; and, if the average health officer should allow the abatement of nuisances to be transferred to some other department, any practical man who has had experience in health work knows that those things which are transferred, those things especially which have anything to do with cleanliness or with health that are in the hands of other departments, would not be very well looked after, because those departments do not realize the importance of this work. It is purely mechanical with them. They do it as a matter of duty. They do not realize, as I said before, how important it may be. One thought that has suggested itself to me is this: If dirt and impure air have no more effect upon disease or upon health than one would be led to suppose by Dr. Chapin's paper, why is so much money being spent, and why is so much being done in all the hospitals of the land, in the way of aseptic preparations in the surgeries? Take the one disease of puerperal septicæmia. We know that a few years ago it was quite common, and we know that certain diseases followed surgery which was not aseptic. To-day it is almost a disgrace in the medical profession to have a case of puerperal septicæmia. It is the same to-day in any hospital to have a wound become infected. Now hospitals, as a rule, are very clean. It is not the specific germ of diphtheria, nor of typhoid fever, nor of those other specific germs that we are acquainted with, that contaminate the instruments or the bandages or the finger-nails of the doctor: it is dirt — it is dirt either in the concrete or in the atmosphere — which serves as the vehicle of infection.

Take the question of plumbing. We know that a few years ago, comparatively few, the average tenement house was very often filthy in the extreme. The health departments took up this question of plumbing; and they insisted on having sanitary plumbing, open plumbing, so that the boards and the things that went to conceal and did conceal dirt were removed. And there is not any question

in the mind of anybody that the conditions for health are improved because of it. We are told, and we know in our own cases, that the mortality rates are being decreased all over the world, that, as sanitary science — and sanitary science, as we have understood it, included the abatement of nuisances and the removal of dirt — has progressed, it has led all over the world to better conditions, longer lives, and more health-giving surroundings.

Take the question of stable manure, to which Dr. Chapin alludes, and the general dirt surrounding the premises of a house. We know now that the fly is an important agent in the spread of disease, and we also know that the fly breeds in stable manure. If we allow heaps of animal refuse to remain about the dwelling or in the dwelling, are we not giving the best of conditions for the propagation and the growth of flies?

I might go on and enumerate other things that have occurred to me; but I had not time to prepare any paper, and these remarks of mine, as a matter of course, are disconnected. They occurred to me as I was thinking the matter over while on the train to-day. But while I am willing to admit, as I said at the beginning, that a great many of Dr. Chapin's statements are true, that health departments are very often called upon in trivial instances to abate things which are really offences to the æsthetic sense rather than real injuries to health, still they go with those other things. How can we separate them without losing sight of some things that are important and that must be attended to, if we are going to have pure air? As I said once before, pure air, it seems to me, is a necessity for good health. I don't know that I can add anything else. I know, of course, with other health officers, that we have found out the causes of certain diseases; but, after all, are not those very few in comparison with the great realm that remains to-day unexplored? Are we not rather on the verge of a great sea, with here and there a beacon light, while the great mass of the waters remains uncharted?

MR. THOMAS JORDAN.— *Mr. Chairman and Gentlemen,*— I want also to thank Dr. Chapin for forwarding me a copy of his paper before the meeting; but I think that, as a layman, I should not enter into a discussion as regards the technical relation between sanitary

inspection and infectious diseases. I must leave that to the physicians; for, when they disagree, I ought not to take sides one way or the other. I will, however, say that the public does not always heed the education offered by boards of health of which Dr. Chapin speaks.

I remember that a short time ago we made an inspection of a house on Pembroke Street in Boston, where there was a case of diphtheria. The patient, a child, died; and the woman of the house sued for damages. Our physician, Dr. Brough, who was called upon to testify, stated before the jury that he thought the plumbing had no connection at all with the diphtheria, and that, as a matter of fact, bad drainage had no connection with diphtheria. In examining that case, we had found a defect in the drain eight feet under the ground, at the connection with an earthen and an iron pipe; and that was the cause of the suit. Notwithstanding the fact that Dr. Brough tried to educate and impress the jury in regard to that matter, they awarded $5,600 damages to the plaintiff. You see that education did not speak for much in that connection.

I am here to-day to speak on the sanitary inspection of tenement houses. The statute law obliges us to make an inspection of all tenement houses in Boston twice a year, and of course we have to obey the law. Until such time as the law is changed, it will be necessary for us to make these sanitary inspections. We have distributed among the gentlemen of the Association here a blank form that we use in making these examinations. In every tenement house we examine first the drainage. We inspect the drainage of every tenement house in Boston twice a year. I will say in this connection that in Boston we have about 5,000 tenement houses,— a little over 5,000. Tenement houses in Boston and in the State of Massachusetts are houses built to accommodate four families: in New York and other large cities are three-family houses; and I think that we should be better off here, as far as improvements are concerned, if the tenement-house law was enforced in the same way here as it is in New York,— if a tenement was construed as being a house to accommodate three families instead of one to accommodate four,— because we find in our sanitary inspection that the three-family houses require just as much attention as four-family houses do.

We also test the drainage in cases of diphtheria, typhoid fever, and consumption. It seems to me that, in looking after cases of consumption, much good is done by the sanitary inspector, and for this reason: We go to each house where there is a case of consumption reported, and under the regulations of the Board of Health of Boston cases of consumption are now required to be reported to the office. We find out just how the patient is living. Of course, it is essential in the case of consumption that a man should live in a clean place, have a good, airy room, and be separated from other people. We often find that the patient sick with consumption is sleeping with somebody else; and we, of course, give instructions to have him sleep in a separate room, away from other people, so that, in my opinion, some good is done in that way through sanitary inspection.

We also very often find in testing the drainage of houses that there are no connections with the sewer, and that brings to my mind a case that I remember a few years ago in one part of the city. I went to examine a stable, and found the cellar of the stable full of water. I notified the owner of the condition of the stable; and he said that it was a spring that had been running in there for a number of years, but he did not know how he was going to get rid of it. I told him that he had better pump the water out, and then we would look it over. He did so. After he had pumped the water out a second time, I went to visit the stable. I detected an odor which I thought was the smell of a disinfectant that was used in the sanitaries of a school-house about five hundred feet away. In making a test from that school-house, I got a return in the cellar of that stable; and, when the men dug, it was found that this school, which had been supposed for years to be connected with the sewer, was draining into the cesspool, and from the cesspool into the stable cellar.

We very often find in making inspection of tenement houses that traps siphon because they do not have proper ventilation. In Boston most of the tenement houses were originally dwelling-houses. A large part of them have been converted from one or two family houses into tenement houses, and traps have been supplied from time to time; and, as a rule, until we asked to have them supplied, we very seldom found a running trap, so that in the cases where the S traps siphon it means an open drain to the pipe sewer in the street.

In these old houses which have been altered over, as anybody who has had occasion to examine them will find, in the old times the water closets were placed in some out-of-the-way place, either under the stairs or down in a dark corner of the cellar, or some place of that kind, where they would not take up much room and where they would be "out of the way." In fact, people generally put the water closet in those days in these houses where they could not put anything else. We have done a great deal of work in the last three or four years in having these water closets removed and placed where they are light and airy, and also in supplying an additional number of them. As a rule, when they alter these old houses over, they increase nothing except the number of people that live there.

We also find in these houses, which were originally intended for one or two families, that they have been cut up by partitions in every imaginable sort of way, so that a large number of the rooms are without light or air whatsoever, except what may be gained from the other rooms. At the present time, in making this tenement-house inspection, we oblige the landlords either to convert a small room at the rear into an addition to the larger room or else to provide shafts for light and ventilation. Another trouble that we find is that houses that have been built for three families are afterward converted into four and five family houses. While they are not on record in the building department as tenement houses, they have become converted into tenement houses. This is done by letting the basement, as a rule, for a store. The storekeeper goes in and partitions off the part of the basement at the rear of his store for a bedroom, and very often makes two partitions, converting the space into a bedroom and kitchen, with the bedroom between the kitchen and the store, and with absolutely no light or ventilation. We also find in these tenement houses that the hallways are very poorly lighted. Under the law, in a tenement house all halls are obliged to have a window opening to the outer air; but in these houses that have been altered over we very seldom find it, so that we are obliged to ask that additional light be provided, either by cutting a window or by putting glass panels into the door of the room so as to afford light through into the hall.

Another trouble that we find in the tenement-house district of Bos-

ton is the overcrowding. This can only be determined at night-time. We have to go about in the night and into these tenement houses, and I must say that the people always take these visits very good-naturedly. It is very seldom that we meet with any trouble at all, as we go in and pass through the bedrooms. What I am about to describe is especially the case in the winter time. The people who labor on the sewers and railroads in the country during the summer time come to town in the winter time, and hire one or two rooms and herd in together; and sometimes they crowd in as many people as it is possible for the place to hold. As a rule, you will find that those rooms are dark. They are not only dark of themselves, but these people hang up overcoats, blankets, and things of that kind, so as to exclude every possible particle of air that they can. Invariably, you will find either a red-hot stove or a kerosene lamp lighted all night long. So you can imagine the condition of the place. These are things that we are obliged to attend to under the law twice a year.

Another great trouble that we have in Boston is the alleys, the rear alleys. Those are things that occasion us more trouble than anything else, for the reason that everybody dumps all his débris into them; and we have nobody to get after to clean up except the owner. Very often the owner lives out of town, and has had no hand in the filth that has accumulated there, does not know anything about it; but under the law he is the only person that we can oblige to clean it up. Our board has very often sent communications to the city government, asking that an appropriation be made and the matter taken care of by the street department in connection with the cleaning of the streets, which could be done very easily; but we have always failed to get an appropriation for the purpose.

Another thing that we have to attend to in Boston under the law is the cheap lodging-houses. There has been a wonderful improvement in regard to them within the last few years, since the board of health made a code of rules governing them. Now no lodging-house can go into business or get a license from the police department until it complies with the rules established by the board of health. I remember a few years ago we went down to the West End, where we found thirty-five people sleeping on the floor of one room, with

not a stick of furniture of any kind in the room, and nothing on the floor except newspapers that some of the particular lodgers had placed under them to keep them off the boards. This room was about 10 × 15 feet. The charge for lodging there was five cents.

Another matter which has been turned over to the board of health by a law which was passed in 1897, and amended in 1899, is the removal of old buildings; and this, I think, is a matter in which the board of health has done good work in Boston. We are going through the city, and have been for the last three years, tearing out the old wooden structures in the rear yards, and wooden ells that have gone to decay, depriving the main part of the house of light and ventilation. In some instances we have gone into the rear part of the lot, and have taken down whole buildings, in order to improve the light and air for the main or front building.

It seems to me that this is good work. We feel in Boston that we have been doing pretty good work in regard to this inspection of tenement houses. Of course, as I said in the beginning, it is not for me, as a layman, to criticise a paper like Dr. Chapin's, because I know very little about that part of it.

MR. COFFEY.— With your permission I want to add one thought that I forgot in connection with my remarks; and that is that, while we do not claim in Worcester that filth causes disease, what we do think and have thought is: Hasn't filth, and its consequent impure air, a devitalizing effect upon the human system, so that people more readily contract disease when they are brought in contact with it? In other words, are persons who are sleeping in unsanitary houses, with unsanitary closets, and with refuse and filth about, as healthy, and is their vitality as good, as those who are living under good sanitary conditions? In Worcester we have gone on in this way, considering that good air was a necessity, and that good plumbing, sanitary plumbing, and clean yards are necessities. We are a large manufacturing community. Our city is the second largest in the State, and has 125,000 or 127,000 people. It is entirely a manufacturing community. All kinds of people are there. Turks and Armenians, and Greeks and Italians, and Swedes and Irish, and French and Jews, all go with native population to make up this

community. And yet the last report of the State Board of Health gave us a mortality rate of something over 14. I think that will compare very favorably with the mortality rate of any large city in the country. It is not due entirely to the better knowledge we have to-day of infectious diseases. In my opinion, it is due largely to the magnificent water supply we have got, to the sanitary plumbing which we have enforced for the last dozen years, to the fact that our houses are not crowded, but are isolated, each house having its own little yard and windows on all sides, and that sun and air are supplied in unlimited quantities. Our effort has been to try to give the people pure air by keeping the yards of the houses and the surroundings clean, and it seems to me that that is an important factor in improving the health conditions.

THE PRESIDENT.— The subject is now open for general discussion, gentlemen.

DR. MAGEE.— I feel that this is a very important subject, and I see some of our laymen have laid some stress on the medical practitioner. I, as one, feel that it is hardly right for a layman to do so. One speaker named septicæmia and other kindred diseases, saying that the medical practitioner is ashamed when he gets hold of a case of the kind. That is not so in medicine. Septicæmia has been from the earliest days, it will be probably till the end of the earth; and there is no practitioner to-day who has a large amount of work to do but will find cases of septicæmia in his practice.

But, coming down to the subject of Dr. Chapin, I feel that his paper to-day has been confirmed by the sanitary inspector of the City of Boston. Brother Coffey in his last remarks has also confirmed the paper of Dr. Chapin by his statements. Cleanliness, fresh air, to the people, I think, are more important than sanitary plumbing. There is no doubt that good sanitary plumbing is a God-send; but I do think that the intelligent people of to-day, and especially the medical profession of to-day, say, "Give us large, well-ventilated, and open rooms, cleanliness of your floors, cleanliness in what you do." I think, if the board of health could educate the people up to that, we should have less contagious disease than we have to-day.

DR. DURGIN.— I wanted to compliment Dr. Chapin in courage and in sentiment. He has done what I hoped he would do. If we cannot all agree upon every point, that is nothing against the paper. It is a good and timely paper. The trend for the last quarter of a century has been in this direction. In my department in Boston we are performing sanitary inspection as a police branch of our service. The work upon infectious disease is done by professional men, in the manner which is recommended by Dr. Chapin in his paper and by Professor Sedgwick in his remarks. I thoroughly agree with both gentlemen in this method of doing work. The time may come — it may not have come — when these two lines of work may safely be divorced, and the police or sanitary inspection be performed by some other branch of the local government. There is this, however, to be said in doing this work, one in connection with the other; and that is that you will scarcely ever make this sanitary inspection without running across that which you must do in finding and treating infectious diseases. I have been reminded by the speakers this afternoon of this one fact: the night work referred to by Mr. Jordan has been most prolific in our experience in finding infectious disease, which would have been found much later, if found at all, had it not been for this police service; and so, too, it may be said in many other branches of this police work.

THE PRESIDENT.— Is there anything more to be said upon the subject of this paper? If not, the next paper upon your programme is by Dr. Chase, "The Abatement of the Mosquito Nuisance in Brookline."

DR. A. E. MILLER.— Mr. President, I wanted to say just a word on that point, if it is not too late. I think a great deal of Dr. Chapin's paper; but are we not liable to sway a little too far the other way? One would almost think it was not necessary to pay any attention to the plumbing, from some remarks that have been made. Every one admits that cleanliness is very important. I have in my mind now a tenement house, and I know several similar ones, where the lady of the house is scrupulously clean and neat; but she went into a house where the plumbing was so bad that it was an

impossibility for that family to have things in decent condition. Bad odors were arising all the time from improper plumbing. While we all admit the importance of pure air, cleanliness, and everything of that kind, can we have cleanliness unless we have proper plumbing? That is a point, I think, we want to look squarely in the face; and we must not be swayed too far the other way. I think it is impossible to have cleanliness in many of these houses unless we have proper plumbing.

THE PRESIDENT.— I now present Dr. Chase, the reader of the final paper of the afternoon.

ABATEMENT OF THE MOSQUITO NUISANCE IN BROOKLINE.

BY H. LINCOLN CHASE, M.D., AND J. ALBERT C. NYHEN.

The great prevalence of mosquitoes every spring, summer, and fall in certain sections of Brookline, the increasing number of citizens in every part of the town, the comparatively recent discovery that intermittent fever is transmitted from a patient to well persons through the bite of a mosquito,— these facts moved five intelligent and influential citizens of Brookline to petition the board of health on Aug. 13, 1901, to consider the feasibility of suppressing the mosquito nuisance. The petition further stated that not only the health and comfort of many citizens was concerned, but that the value of real estate in certain localities was likely to be affected, and that, therefore, the question was for several reasons well worthy the serious consideration of the board of health. About the same time a number of letters of the same general purport were received from individual citizens, bitterly complaining of their inability to enjoy their piazzas or grounds after sundown because of the mosquito.

At its next meeting the board of health voted to refer the matter to its agent, Dr. Chase, for investigation and report, with recommendations. The report was duly made, and summarized most of the information then available on the subject, much of which was

secured from Dr. Theobald Smith's valuable and interesting paper on the subject given before this Association at its meeting in July, 1901, partly from Dr. L. O. Howard's book entitled "Mosquitoes," and much also from the experience of our medical officers in Cuba in suppressing the mosquitoes that transmit malaria and yellow fever. The board promptly authorized its agent to proceed along the lines recommended in his report.

We prepared a list, with the help of our police department, of nearly all the stagnant water in the town. We next marked the exact location of all these places on the town map, and had them systematically inspected and reported on by Mr. Nyhen, the board of health laboratory assistant, as to the presence or absence of larvæ, and of their natural enemies, frogs and fish.

An examination was also made of a number of our street catch-basins; and, with the exception of those few that received large quantities of cold water from neighboring stand-pipes, all were found to be teeming with mosquito larvæ, all of which were those of culex. Our largest body of water, Leverett Pond, was found at that time to be entirely free from larvæ, minnows and other fish being quite plentiful. Other ponds that had either no larvæ visible, or only very small ones, were found to be well supplied with frogs. Most of the ponds, pools, and ditches, however, were found to be breeding-places of mosquitoes, all furnishing larvæ of culex in abundance; and quite a number, notably those off upper Boylston Street, where malaria has been more or less prevalent for some years, had numerous larvæ of anopheles.

We secured a barrel of light fuel oil; and, in September, Mr. Nyhen, with the help of a laborer and a horse and wagon, treated a single time all of the breeding-places of anopheles and all the more important breeding-places of culex in the more thickly populated sections of the town, including 250 catch-basins. Every pond surface was measured more or less accurately. Light fuel oil was then applied and the surface of the water well agitated with a pole to hasten the diffusion of the oil. As an experiment, we also put quick-lime into a few shallow pools, but were rather disappointed in the results. Later we filled in all shallow pools. The oil treatment we found very successful as a temporary measure, especially in the catch-

basins, all of which, almost three weeks after treatment, remained wholly free from larvæ.

At the same time that we began to treat the larger breeding-places of mosquitoes, we distributed by the police to each family in town the following circular of information: —

OFFICE OF THE BOARD OF HEALTH,
BROOKLINE, MASS., Sept. 9, 1901.

MOSQUITOES.

Both malarial and common mosquitoes are numerous in Brookline, and the Board of Health invites the co-operation of citizens in its efforts to diminish their numbers and to reduce the areas in which they breed.

Mosquitoes always lay their eggs in water, as the young (larvæ) cannot live elsewhere. They rarely fly far, and their presence is usually accounted for by the existence of standing water close at hand. The eggs and larvæ abound throughout the season in ponds, pools, puddles, cisterns, rain barrels, water buckets, old tin cans, clogged gutters, and, in fact, anywhere that even a very little water is allowed to stand for a few days.

Experience in other places has shown that much good can be accomplished by giving attention to all the standing water in any neighborhood. In permanent ponds, fish and frogs, if in sufficient numbers, will destroy the eggs and larvæ; but care is needed to see that small pools around the edges are filled up or treated with oil. Unnecessary pools and puddles of all kinds should be drained or filled up. A little kerosene oil (preferably "light fuel oil") put into standing water spreads easily and rapidly over the surface, and, without injuring the water for other purposes, destroys the larvæ, which are unable to breathe, and prevents the laying of eggs. An ounce of oil is sufficient for fifteen square feet of surface; and an application of it is effective for about two weeks, at the end of which time it should be renewed. Good results have also been obtained by putting unslaked lime into standing water.

The mosquitoes which live through the winter in cellars and barns, under bridges, and in other sheltered places, lay eggs again in the following spring; and it is believed that active measures taken now will materially reduce the numbers to survive the winter. The Board intends to treat some of the worst places in town with oil at once, and to remove certain stagnant water entirely, and also to follow the matter up closely early next year. Citizens are urged to look after all standing water on their own premises.

By order of the Board,

JAMES M. CODMAN, JR., *Chairman.*

H. LINCOLN CHASE, M.D., *Agent.*

OUTFIT OF 1901.

Mr. Nyhen was given the personal supervision of the work in the field, under the direction of the agent of the board. He was

allowed one laborer at $1.75 per day to assist him. Our equipment consisted of: —

1 hired horse and light wagon.
1 outfit for collecting specimens of larvæ, pupæ, and adult mosquitoes.
1 five-gallon oil-can.
1 single-gallon watering-pot.
1 brass spigot.
2 galvanized iron oil dripping-pans.
1 pick.
1 funnel.
50 gallons light fuel oil.

Beginning the work in September, we hoped to destroy the last mosquito larvæ of the season, the ones that otherwise would have matured and lived through the winter, to produce the first brood of mosquitoes of the following spring. So much for the season of 1901.

Early in 1902 the board appropriated a moderate sum of money for mosquito work, and those in charge prepared to make an early start. For various reasons, however, work could not be begun until early in May; while the mosquitoes appeared in considerable force late in April.

A second circular of information, more particularly in regard to the cause and prevention of malarial fever, was prepared, and distributed by the police to every family in town. This circular was as follows: —

CIRCULAR OF INFORMATION IN REGARD TO THE CAUSE AND PREVENTION OF MALARIAL FEVER.

OFFICE OF THE BOARD OF HEALTH,
BROOKLINE, MASS., May 26, 1902.

Many physicians now believe that malaria is transmitted from one person to another through the bite of a certain kind of mosquito, and that, where conditions are not favorable for breeding mosquitoes, malaria is unlikely to obtain a foothold or to spread.

The Board of Health desires to prevent all chance of malaria in Brookline, and invites the co-operation of citizens in taking certain simple precautions.

Malaria has recently been included among the diseases to be reported to the Board of Health by physicians or by householders where no physician is called.

Great care should be taken to prevent mosquitoes from biting any person who has malaria, since it is only by biting such a person that they are enabled to transmit the disease to others. This is one of the most important things to be kept in mind when a case of malaria occurs.

As mosquitoes breed only in standing water and often in quite small pools and ditches, a great many of them can be destroyed by filling up or draining off holes and pools and emptying water barrels, pails, clogged gutters, tin cans, unused cisterns, and other receptacles. When, for any reason, standing water is unavoidable, a thin coating of kerosene oil spread over the surface kills the young mosquitoes.

Much can be done by individuals to supplement the work of the Board. All citizens are urged to help, especially in the direction of doing away with unnecessary standing water, however small in amount. Kerosene poured upon water from a can or pail spreads rapidly over a considerable surface. With an ordinary hand pump, such as is in common use for washing windows, a greater area can be readily "petrolized." The Board of Health should be notified of all pools which cannot be taken care of by individual effort.

By order of the Board of Health,

JAMES M. CODMAN, JR., *Chairman.*

H. LINCOLN CHASE, M.D., *Agent.*

In response to the request to the citizens to report all probable breeding-places known to them, numbers of notifications were received.

THE OUTFIT FOR 1902.

Mr. Nyhen was placed in immediate charge of the work as previously, and most of the season he had at his disposal two laborers at $1.75 each per day. The equipment consisted of most of that of 1901, and in addition we had the following list of articles: —

4 five-gallon oil-cans.
1 ten-gallon oil-can.
2 picks.
2 hoes.
2 rakes.
2 shovels.
2 scythes.
2 Breck hand force-pumps.
3 one-gallon watering-pots.
16 feet of hose in three sections.
3 galvanized iron pails.

2 pairs of deep-water leather boots, for use by men handling oil.
3 pairs of deep-water rubber boots.
1 zinc wagon pan.
500 gallons of light fuel oil.

This outfit proved to be somewhat inadequate, but the tools and utensils used were as suitable as could be found. More satisfactory tools might be devised. We badly needed two or three more laborers.

Methods of Work.

(1) All pools, ponds, ditches, and other breeding-places, including catch-basins, were located upon the town map. We also located and treated a number of breeding-places just beyond the town's borders.

(2) The approximate areas were determined, and the number of catch-basins ascertained.

(3) Breeding-places of culex and anopheles, respectively, were determined, and also the places where both species were breeding. This we did in order to learn the proper intervals for treatment; that is, whether every three weeks or every four weeks.

(4) The location on the town map of the public dumps or other places where accidental receptacles of water were to be found; for example, tin cans, boxes, etc.

(5) Details of treatment, temporary or permanent. Petrolizing, and necessary work preliminary to it. Last, but most important of all, filling or draining.

Treatment of Catch-basins.

Three ounces of light fuel oil we found to be the necessary quantity for each treatment of one of our street catch-basins. This will keep the catch-basin free from larvæ, and prevent mosquitoes from laying their eggs for a period of about three weeks. The laborer partly removes the cover of the catch-basin with a pick, thrusts his watering-pot two-thirds full of oil into the opening, and about a foot below the street level he makes one turn and one-half with his wrist, the oil flowing freely through the sprinkler nozzle, and only being permitted to run during the wrist movement. The amount

stated (3 oz.) is, of course, only approximate, but is sufficiently accurate. Thus 950 catch-basins have been treated six times during the season just ended. The amount of oil used in one treatment of the 950 catch-basins was 2,898 ounces, about three pints in excess of the calculated amount (*i.e.*, 3 oz. for each), 2,850 ounces. The excess never exceeded one-half gallon of oil on 950 basins. If rubbish was found in the basin, the water was well agitated by the petrolizer. The entire treatment of a basin took from two to five minutes, depending upon the ease with which its cover was replaced.

The Treatment of Ponds and Ditches.

The amount of oil used for a given pool or pond we determined as follows: Calculate the amount necessary from Dr. Howard's rule, one ounce of light fuel oil to 15 square feet. If the pond had vegetation growing luxuriantly in it, irregular shores, and a large amount of vegetation about it, we added an excess of one-fourth of the original amount. If the pool presented a clear water surface, we added one-sixth more than the usual amount. Pools well stocked with fish did not require a film of oil over the entire surface; but a belt about 15 feet in width, extending around the shores, was thoroughly treated.

If a pool or pond had fish or frogs in it, we examined it very carefully until we were satisfied that it was not a mosquito-breeding pool; for we found a number of ponds well stocked with fish and frogs were, nevertheless, breeding-places of culex and anopheles. We found that the film of light fuel oil did not kill the natural enemies of mosquito larvæ; namely, fish, frogs, etc.

In treating ditches, the amount of oil was calculated and distributed as evenly as possible; and, if necessary, the water was well agitated.

After the oil had been evenly spread upon the pond from the most favorable working points, a man styled the "puddler" violently agitated the water with a hoe. These photographs, kindly taken for us by Dr. Walter G. Chase, show very faithfully some breeding-places of mosquitoes and our methods of treatment. At the end of a week the superintendent examined the water for traces of breed-

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ing. He depended on his own observations, and not on those of his untrained men. There were many details to be carefully attended to: otherwise, the men would not always apply their efforts to the best advantage.

The treatment of pools, ponds, and ditches where rank vegetation was abundant, was begun by removing this vegetation with scythes as completely as possible for the distance of fifteen feet from the edge of the pool to be treated. The shallow pools, if not large in area, were filled in with material from the immediately higher land. If a pool stood near a dump, we gathered into it accidental receptacles and covered them with sufficient soil. We drained or filled in many small pools.

Many problems arose in this work, and methods and their solution had to be devised by the superintendent.

Accidental Receptacles.

We found in our public and private dumps very many small receptacles of water which proved to be important breeding-places of mosquitoes, especially for anopheles. We gathered all metal receptacles that would hold water, and either used them in filling up pools or buried them. Bottles and wooden receptacles, and vessels of breakable material, we simply broke up.

Reports of Progress.

From time to time we prepared reports to the board of health of progress made in our work, of which the following is a sample: —

REPORT OF PROGRESS ON MOSQUITO WORK.

Brookline, Mass., May 26, 1902.

To the Board of Health:

Gentlemen,— Since the report on mosquitoes, sent in on May 19, over 950 catch-basins have been thoroughly treated with oil. The locations are shown on the accompanying chart. The ditches in the Washington Playground have also been treated. Of the 550 remaining catch-basins, about 150 need to be treated, also the ponds on the Wright estate, and those near Hammond's Pond, in the Chestnut Hill District. Permission has just been received for treating the ponds on the Wright estate. We may add that no one, thus far, has objected to our work on private grounds. These ponds were found to be breeding malarial

mosquitoes, as well as the common mosquito. After treating the Wright ponds and the 150 catch-basins referred to, it will be necessary to sprinkle again the pools first treated. If the weather becomes cool, their second treatment will be deferred for a week, and work will be done on the as yet untreated Chestnut Hill pools, and in clearing the banks of the most centrally located stagnant water in the town.

In order to fill in the shallow pools on public dumping-places and to prepare a large number of ponds and pools for more effective and more economical petrolizing, the recommendation made last week is renewed; namely, that three additional men be employed for a short period. After this extra work has been accomplished, two men, with such supervision as Mr. Nyhen will have time to give, will be able, in my opinion, to attend satisfactorily to the work during the rest of the season.

I earnestly hope that the matter may receive the early attention of the Board, and that it will favorably consider requesting the necessary appropriation for this work at the June town meeting.

Respectfully submitted,

H. LINCOLN CHASE,
Agent of Board of Health.

Of course, petrolizing is but a temporary expedient: only draining or filling in can result in a permanent removal of a mosquito breeding-place. To this end the board directed Mr. Alexis H. French, Town Engineer, to examine and report upon, with reference to their drainage, several sections of swamp land, and to furnish an estimate of the probable cost of the drainage. In this connection the following letter from Dr. Abbott, secretary of the State Board of Health, is of interest: —

BOSTON, May 22, 1902.

DR. H. L. CHASE, Agent Board of Health, Brookline:

Dear Doctor,— In reply to your further inquiry, on behalf of your Board, there can be no doubt that wet lands and stagnant bodies of water constitute a serious nuisance, especially in thickly settled towns, since, when the question is considered both subjectively and objectively, the presence of human beings is essential to the existence of a nuisance. Wet lands in uninhabited districts are of course not dangerous, because there are no human beings to whom they may prove harmful; but in large towns the case is necessarily otherwise.

The Statutes (Revised Laws, Chap. 75, § 75) already provide that "land which is wet, rotten, or spongy or covered with stagnant water, so that it is offensive to residents in its vicinity or injurious to health, shall be deemed a nuisance"; and the recent discoveries relating to the dangerous nature of insects bred in such places only strengthen the statement expressed in the Statutes.

Yours respectfully,

SAMUEL W. ABBOTT,
Secretary.

The final treatment for the season of all the catch-basins and other breeding-places was given during the month of September.

Results.

Our work had not been going on more than a month when many citizens noted and favorably commented on the marked diminution in the number of mosquitoes in the formerly infested districts, especially the Longwood District. The work went steadily on; and the results were such that the board of health soon increased the mosquito working force from one laborer to two, and provided a little more money. So great an improvement was noticed in every district treated that letters of commendation from many representative citizens were received. Below are given a few extracts from some of these letters: —

Brookline, Mass., July 24, 1902.

Dr. H. Lincoln Chase, the Board of Health, Brookline, Mass.:

My dear Dr. Chase,— Let me most heartily congratulate you upon the splendid success you have achieved in connection with the mosquitoes. I am indeed delighted, and you are deserving of all the congratulations and expressions of praise that you will receive from all hands; and I am glad to see that the Boston papers are giving you a little of the commendation that is due you. As a matter of fact, in my opinion, you are entitled to just as much praise and credit as though you had cleaned out a deadly disease; for, truly, Brookline in 1901 was so utterly unendurable that there was no comfort or enjoyment in living there at all, but now it is entirely different. I am almost never troubled now in any way, and I believe that, with the valuable work you are doing, another year will see the end of these infernal pests.

Very sincerely yours,

—— —— ——.

Brookline, July 25, 1902.

Dear Dr. Chase,— You may be interested to know the state of matters on our golf links since the pond was petrolized. Before that was done, the mosquitoes were infernally affectionate, and took all sorts of liberties with the players. Since the first application of the petroleum, there has been a very marked change for the better. In going through the ravine, we now seldom see a mosquito, and are not troubled by them in the least. Whether the cool weather has anything to do with this gratifying state of affairs, I do not know as well as you do.

I wish to express to you and to the Board of Health of Brookline our appreciation of the good work done on upper Boylston Street in this matter.

Very truly yours,

Geo. W. Gay, M.D.

The most important object of this work — namely, the prevention of malarial fever — should not be overlooked. In December, 1897, the agent of the board wrote to most of the practising physicians of the town, requesting each to report to him, as a favor, the number and location of his malarial fever cases, of tertian type only, seen by him during the previous season. The total number of typical cases reported was not less than fifty. The past season the board of health has required the reporting of every new case of malarial fever, and has received notice of only twelve cases.

The writers regret that the latter part of the past season was unusually cool, thus making a test of the work somewhat less severe than during the earlier part of the season.

The total cost of this work, up to the middle of September, in addition to the loss of time involved in its supervision, was $625.57. With the expenditure of twice this sum the next season, even more satisfactory results could be obtained.

In our work we had assistance from our bacteriologist, our town engineer, our superintendent of streets, our park commissioners, and some other town officers.

We have made a beginning; and we venture to hope that in a year or two, with the co-operation of the adjoining municipalities, Boston and Newton, we may have a town where malarial fever* will no longer exist, and where mosquitoes will be too few to be a nuisance.

CIRCULAR OF INFORMATION FOR FAMILIES IN WHICH A CASE OF MALARIAL FEVER IS REPORTED.

OFFICE OF THE BOARD OF HEALTH,
BROOKLINE, Nov. 15, 1902.

It is now quite generally believed that malarial fever is transmitted only through the bite of a certain kind of mosquito, the anopheles. It is probable that localities are malarial only because they furnish favorable conditions for breeding these insects. Even in such districts, however, malarial fever does not occur unless some human being comes there with the disease and is bitten by the anopheles mosquito.

It is very important, therefore, that mosquitoes should be kept away from any person who has malaria, since it is only by biting such a person that they become

* Appended is our latest circular of suggestions for families in which cases of malarial fever may be reported.

dangerous to others. As mosquitoes breed only in standing water, and chiefly in quite small pools and ditches, the importance of filling up holes and pools, and emptying water barrels, pails, clogged gutters, tin cans, and other receptacles, is very great. As far as possible, all land with stagnant water on it should be drained.

Mosquitoes often remain in a house through the winter, and become dangerous on the return of warm weather. The Board of Health is taking precautions to prevent the spread of malaria in Brookline, and invites the co-operation of citizens, especially in the direction of doing away with all unnecessary standing water, however small in amount.

The following precautions should be taken at once in every household in which there is a case of malaria: —

(1) The prompt treatment of the patient with quinine, under the direction of a physician. The quinine destroys the malarial organisms in the blood, and therefore serves both to cure the disease and prevent its being transmitted to others.

(2) *The protection of the sick persons from the bites of mosquitoes*, by careful screening of doors and windows, and by killing all the mosquitoes that can be found in the house. The importance of doing this is evident, if it is remembered that malaria can only be transmitted from the patient to a well member of the family by a mosquito biting first the sick and later a well person.

An order was adopted in May, 1902, including malarial fever among the diseases that must be reported to the Board of Health by physicians, or by householders if no physician is called.

By order of the Board of Health,

JAMES M. CODMAN, Jr., *Chairman.*

H. LINCOLN CHASE, M.D., *Agent.*

THE PRESIDENT. — Mr. Underwood's name is down for the discussion of this paper.

MR. UNDERWOOD. — Mr. Chairman, I am very sorry that Dr. Smith is not present to lead this discussion, because he is no doubt one of our best authorities on mosquitoes in New England. I think that every one who has been here to-day must certainly have been impressed with the splendid energy which we have seen displayed by the Brookline Board of Heath toward the better protection of the public health. We have seen their well-equipped bacteriological laboratory, their perfectly appointed contagious hospital, their public baths; and we have just heard the account of their very interesting and successful fight against the mosquito.

A great many of us may reside in towns where it would be hard to get the people interested in this subject of mosquito extermina-

tion or to raise the money necessary to carry on such work. In looking into the mosquito problem somewhat during the last year or two, I have found that a great many people are not really aware of the first principles of mosquito extermination. They do not know that mosquitoes come from the water. In spite of all the literature which has been written and published on the subject in the last few years, a great many persons out in the country do not know to-day where mosquitoes come from. An illustration of this fact came to my attention during a recent trip to Maine. I was interested in looking up mosquitoes in some of the pools in the woods. The Indians and the guides pooh-hooded the idea that the little wigglers, which we found there, would ever turn into mosquitoes. They could not be persuaded that they would do so. It was not until I put some of the larvæ into a glass of water and took them into the camp, and got some of the guides and Indians to watch them, that they became firmly convinced that these little wigglers were mosquitoes. After they had seen the little fellows transform from the larvæ into pupæ, and then from pupæ into the adult mosquitoes, they began to get interested. I have seen those men watching mosquitoes by the hour, with their hands on their chins, their elbows on the table, so interested had they become in the subject. We do not need to go to the country districts of Maine to find ignorance upon this subject. Many people in our near-by towns are uninformed.

A good many of us, as I have said before, may be inhabitants of towns where it would be hard to get the money together to fight mosquitoes; but we might get the people aroused to action in a very simple way. Let us interest the teachers and children of our public schools in the question. Nothing better could be done by some of the local boards of health than to furnish mosquito larvæ in June to the teachers of the public schools. Let them keep some in glass jars upon their desks, so that the children can watch them. If the child once sees the wigglers transform or if he once sees a mosquito emerge from the larval stage, coming forth as an adult insect, he will become interested at once. He will take the matter up at home, and tell his parents about it; and soon we can spread, at a very little expense, a knowledge that will be of some benefit.

I think that every board of health should make some provision to

get some larvæ in the spring, before schools close for the summer vacation, and give them to the teachers, and tell them in a simple way about their life history. It seems to me that much good work can be done in this way at a very little expense.

THE PRESIDENT.— Is there anything else to be said upon this extremely interesting subject? Haven't you got something, Dr. Hill? I thought I saw a responsive look.

DR. HILL.— I should like to suggest that it would be advisable, I think, for all boards of health to put the reporting of malaria on a compulsory basis. It would help us to know exactly what is happening in that line.

THE PRESIDENT.— If there is nothing more to be said upon this subject, this concludes the list of papers for this evening. Is there any other business that can now properly come before the Association?

DR. KITE.— Mr. President, I should like to suggest that there has been only one number on the programme that has not been thoroughly satisfactory; and that is the first discussion. It seems to me that Dr. Hill and Dr. Chapin and Dr. Denny have done an immense amount of work in regard to the report on diphtheria bacilli in well persons, and I move that their conclusions be read at the next meeting and that the discussion be continued at that time.

The motion was adopted.

THE PRESIDENT.— It will appear on the programme at the January meeting.

MR. PILSBURY.— I fear that the many who have gone would not forgive the few who remain if we did not pass a vote of thanks to the Brookline Board of Health for their courtesy and kindness.

Cries of "Second the motion."

DR. DURGIN.— I move a vote of thanks of the Association to the Brookline Board of Health for its warm welcome and its excellent entertainment of the Association to-day.

The motion was adopted, and the Association then adjourned.

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JOURNAL

OF THE

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OF

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An Official Quarterly Record of
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APRIL, 1902

Proceedings of the January Quarterly Meeting

Subject: Small-pox and Vaccination

BOSTON
THE MASSACHUSETTS ASSOCIATION OF
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E. W. McGLENEN, City Registrar.

March 31, 1902.

JOURNAL OF THE MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH

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The Result of Imperfect Combustion of Fuel

Paper by Mr. Edward N. Warren

Addresses by Prof. W. T. Sedgwick and Inspector Raynor, of the New York Board of Health

Report of the Committee on Diphtheria Bacilli in Well Persons

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All persons holding appointments as members of a Board of Health in a Massachusetts city or town, the executive officers of such a local board, and the members of the State Board of Health are eligible to membership. Other persons may be elected members by vote of the Association. The annual dues are one dollar and fifty cents, and should be paid to the Treasurer, James B. Field, M.D., 329 Westford Street, Lowell, Mass.

The Association holds four regular meetings each year, the annual or January meeting always being held in Boston.

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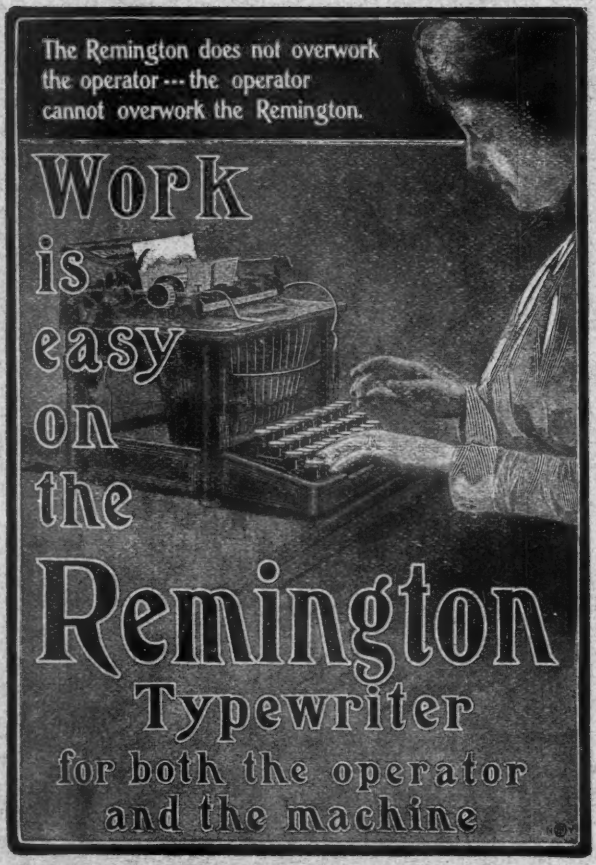

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JULY, 1902

Proceedings of the April Quarterly Meeting

The Imperfect Combustion of Fuel. Paper by Mr. Edward R. Warren. Remarks by Professor W. T. Sedgwick. Remarks by Mr. Russell Raynor, of New York.

Report of Committee on Diphtheria Bacilli in Well Persons. Part I. The Application of Results. Part II. Results of Bacteriological Examinations, with introduction by Dr. Theobald Smith.

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Proceedings of the July Quarterly Meeting

The Preparation and Free Distribution to Boards of Health of Antitoxine.

Location of Small-pox, Diphtheria, and Scarlet Fever Hospitals.

The Reporting of Cases of Chicken-pox.

Provision for the Care and Isolation in Hospitals of Patients Ill with Measles.

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An Official Quarterly Record of Information for the Public.

JANUARY, 1903

Proceedings of the October Quarterly Meeting

Sanitation in the Schools.

Sanitary Inspection of Tenements.

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THE OFFICIAL JOURNAL OF THE ASSOCIATION is a quarterly publication, containing the papers read at the meetings, together with verbatim reports of the discussions following them.

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Gaseous Disinfectants.

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